Puget Sound Water Quality Action Team
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Sound WAVES

Reports on Puget Sound's health released:

Vital signs show continuing problems and challenges for restoration and protection

The news from the most recent "check ups" for Puget Sound is mixed. The messages are like those a physician might offer to a relatively healthy, but typically sedentary, resident of the region.

The health of Puget Sound—our patient—needs improvement, and the problems we've been discussing for years don't seem to be getting any better.

- **Problems we have known about for years and decades are still evident.** For you or me, this might mean too many pounds carried around the middle or too little exercise. For Puget Sound, it's the relatively tough-to-fix problems of toxic contamination of sediments and fish in our urban bays and waterways.
- **Some measures indicate improving conditions.** A physician may note decreases in high blood pressure or cholesterol readings. Among other things for Puget Sound, it is continued improvement in the amount of Pacific herring spawning in central and south Puget Sound and improving water quality in some shellfish growing areas.

Photo courtesy of the Washington Department of Ecology

Scientists perform regular checkups on the health of Puget Sound. Their work provides valuable data on a number of indicators that tell us if the condition of the Sound is getting better or worse.

- **Some indicators show increasing problems.** A physician might find, for example, failing eyesight or loss of mobility. For Puget Sound, we see broader evidence of declines in marine fish species in recent years. The pattern of declines observed in recent years is cause for special concern. The numbers of rockfish that can live 80 to 100 years, and the number of prey organisms, such as herring that live only a few years, have been declining in most areas of the Sound since the 1970s. This pattern suggests significant ecosystem changes—that we are only beginning to understand—may be underway.

This spring, the Puget Sound Water Quality Action Team is updating two reports on the health of water and marine life in our Puget Sound. You may have already read ***Puget Sound's Health 2002***—it was inserted into many newspapers around the Sound in early May. This is our third such report on environmental indicators for Puget Sound. We hope this report will increase your understanding of the challenges facing Puget Sound's future and the types of things you can do to improve the outlook for the Sound.

The ***2002 Puget Sound Update*** will be distributed later this spring. This is the eighth report of the Puget Sound Ambient Monitoring Program (PSAMP), a long-term effort to assess the condition of the Puget Sound ecosystem. This report will be distributed to many scientists and resource managers throughout the region.

*See **Health,** page 2*

Puget Sound Water Quality Action Team

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Inside This Issue

LEGISLATIVE update

Puget Sound reaps rewards from 2002 session

Washington State legislators struggled with significant budget issues and transportation matters throughout the 2002 session. However, at the end of those days, legislators passed some sound legislation for Puget Sound.

The following are highlights from bills that should help protect and improve the quality of water and marine life in the Sound.

Derelict vessels—Defined "abandoned" and "derelict" vessels; declared owners financially responsible; enabled government organizations to obtain, dispose and recover the costs of removing derelict vessels; allowed removing 100 vessels a year from Puget Sound.

Green building—Created a task force to study **green** building, including low impact development techniques, to gain further use of such practices throughout Washington.

Derelict gear—Directed Washington Department of Fish and Wildlife to work with others to publish guidelines for removing and disposing lost fishing gear; supported the Action Team's and others' joint efforts with the Northwest Straits Commission to reduce the harm derelict gear does to fish and shellfish.

Ballast water—Created a work group, which is chaired by the Governor's Executive Policy Office and will include representatives from the Action Team, the Puget Sound Steamship Operators Association, the Columbia River Steamship Operators Association, Washington Public Ports Association, the petroleum transportation industry, and the environmental community. The group will review ballast water control measures aimed at preventing aquatic nuisance species from getting into Washington's waterways.

Invasive aquatic species—Defined "invasive species" and concepts; authorized the Department of Fish and Wildlife to classify non-native aquatic animal species, develop a plan to eradicate or completely remove species that are health threats, designate state waters as infested, notify the public of infested waters, and develop an inspection plan for watercraft entering the state; and banned the possession of aquatic animal species classified as ***prohibited,*** making possession of such species a gross misdemeanor.

Unfortunately, in achieving a balanced budget, the legislature reduced the Department of Fish and Wildlife's Puget Sound funding by $493,000. This reduction puts at risk components of the Puget Sound Ambient Monitoring Program, technical assistance for habitat protection and management of aquatic nuisance species.

For more information about the details of these bills, contact Terry Hull, the Action Team's legislative liaison, at (360) 407-6314 or thull@psat.wa.gov.

Health, *continued from page 1*

Describing Puget Sound as a patient in health care context may help us understand how we might move from simply reporting about environmental conditions to using the information to transform our future. The overall message for stewards of Puget Sound is that we need to seriously re-examine many of our lifestyle choices and better follow technical advice about how to help restore Puget Sound to a more robust condition.

We can work together to protect the Sound so we can continue to enjoy its beauty and resources. Citizens, service groups, businesses, and state, tribal, and local governments are working together to protect and restore many areas.

What is AMBIENT MONITORING?

Ambient monitoring measures the overall condition and often the long-term trends of the environment. Other types of monitoring may focus on conditions at localized areas such as near a pollutant source or where a particular experiment is taking place.

We hope individual citizens and all types of governmental and non-governmental organizations will understand and respond to the challenges facing Puget Sound. You can help by choosing just one new action to protect the Sound (actions are outlined at the end of ***Puget Sound's Health***), sharing your knowledge of the Puget Sound ecosystem and explaining our connections to the ecosystem with your friends and neighbors.

You may view both Puget Sound reports on the Action Team's website at www.wa.gov/puget_sound.

Measuring Puget Sound's Health

Scientists and citizens from around the region measure the health of Puget Sound through ongoing monitoring programs, one-time environmental assessments, and projects that research the Puget Sound ecosystem.

PSAMP, a coordinated effort by five state agencies and their federal and local partners, provides basic information about status and trends related to a number of key measures. The Puget Sound Water Quality Action Team relies on PSAMP; other state, federal, local and tribal programs; and citizen monitoring efforts (see pages 4 and 5) to develop the information presented in its reports on the health of Puget Sound.

On page 6 you'll find a story about a PSAMP scientist and his colleagues who are working to understand more about marine bird and mammal populations.

News From Around Puget Sound

Snohomish County

The **Friends of Cemetery Creek Watershed** group is conducting a two-year water quality monitoring effort at nine sites in the watershed of Cemetery Creek, which feeds into the Snohomish River near the City of Snohomish. So far, the groups' monitoring efforts have identified low dissolved oxygen and high turbidity (cloudy, dirty water), which are unhealthy for salmon. Data collected through this effort is on Snohomish County's website: http://www.co.snohomish.wa.us/publicwk/swm/steward/index.htm. The group is also monitoring returning salmon as part of the County's SalmonWatch program. The group identifies potential habitat restoration sites and educates residents in the watershed about the value of the creek and its riparian areas. Friends recently distributed educational materials to 150 streamside landowners. In addition, the group works with Snohomish County staff and landowners to install watershed and stream crossing signs and native growth protected area signs throughout the watershed. Working with the County's Habitat and Rivers Group and the City of Snohomish, Friends is helping to complete a feasibility study of two potential stream restoration projects. Contact: **Janet Carroll**, Snohomish Watershed Steward at (425) 388-3464, ext. 4572, jrcarroll@co.snohomish.wa.us.

Photo by Janet Carroll

Volunteers Jim Pilling and Steve Campbell take water quality samples at one of the Cemetery Creek monitoring sites.

Jefferson County

One afternoon in early May of 1792, Captain Vancouver ran aground on a muddy bank in the shallow waters of Discovery Bay. He wrote: "This lead to the discovery of a species of small Oyster with which the bottom was plentifully strewd …" That plentiful bivalve was the Olympia oyster. Through a grant from the Northwest Straits Commission, the **Jefferson County Marine Resource Committee** (MRC) is embarking on its own journey to reintroduce and eventually develop naturally spawning populations of they Olympia oyster in Discovery Bay and other parts of the North Olympic Peninsula. In partnership with the Puget Sound Restoration Fund, Jamestown S'Klallam Tribe, and Washington Department of Fish and Wildlife's Point Whitney Shellfish Lab, the MRC has tentatively made plans to determine suitable habitat; involve other interested parties; collect genetically appropriate brood stock; select seeding methodologies; conduct seeding events; and monitor the results. Contact: **Dave Christensen** at Jefferson County (360) 385-9418, dchristensen@co.jefferson.wa.us.

Mason County

In January 2002, the Hood Canal Coordinating Council honored the **Madrona Beach Community** with an Environmental Achievement Award, capping decades of concern for local water quality and shellfish resources. In 1997, when on-site sewage system surveys revealed two failing systems and many others with cracked tanks, residents joined together to find a solution. With support from Public Utility District #1 and staff from county and state agencies, residents secured a state grant to build a community system. Now, instead of 18 individual systems in the closely built waterfront area, wastewater is pumped to a collection tank across the highway, and then another 500 feet to a hillside drainfield. The residents' contribution to the $300,000 project included land for the drainfield, $7,500 per household, and countless hours spent in grant writing, community coordination, and consultation with engineers and contractors. Teri King, marine water quality specialist for Sea Grant, nominated the Madrona Beach Community for the award, citing it as a good example of "how motivated citizens can make a huge impact on water quality and the health of Hood Canal." Contact **Barb Levette** at (360) 898-7800.

Skagit County

The Skagit Conservation District coordinates a suite of volunteer programs to help people in Skagit County care for their valuable water resources. Efforts took root in 1994 when the district introduced its **Watershed Masters Program.** The program often has a waiting list and provides 40 hours of training to new volunteers each fall who then assist with a range of water-related projects. In 1998 the district added the Skagit Stream Team Program, which equips about 40 volunteers each fall to monitor water quality in priority streams from October to June. In 2000, the district again expanded its lineup, partnering with the Skagit County Health Department to monitor local recreational shellfish beaches for paralytic shellfish poisoning (PSP). Volunteers participate in a two-day training event in the spring then collect shellfish samples for testing through the summer months. More than 350 people have participated in the district's volunteer programs and contributed more than 16,000 hours of service. Contact **Kristi Carpenter,** Skagit Conservation District, (360) 428-4313, kristi@skagitcd.org.

Pierce County

Pierce County and **WSU Cooperative Extension** staff have formed a partnership with the consulting firm AHBL to develop low impact development design standards that address stormwater, traffic, architectural character, landscape, and green building technologies. AHBL conducted a comprehensive site analysis and redesigned Kensington Estates, an existing project, as a demonstration site. The refined design reduced the paved area of the site from 17 percent to less than 4 percent. The design includes green streets (corridors that serve as open space and as walking paths) and also uses vegetation to retain stormwater runoff on the property. In 2001, the Washington Chapter of the American Association of Landscape Architects presented a People's Choice Award to the project. Contact: **Len Zickler,** AHBL, Inc. (253) 383-2422 or the Pierce County website at www.piercecountywa.org.

AHBL

Kensington Estates demonstration site

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(253) 333-4920

Volunteer Focus

Sue Nattinger

Clallam Streamkeepers

Photo courtesy of Clallam Streamkeepers

Sue Nattinger breaks out her monitoring equipment alongside Bagley Creek in Clallam County.

Sue Nattinger, a medical laboratory technician in a Port Angeles hospital, works with other members of Clallam County Streamkeepers to restore and protect stream habitats.

When she's not testing tissue and blood to diagnose health problems in the body, Sue uses her technical skills to help diagnose problems affecting Clallam County streams and ecosystems. Her position as a volunteer monitor and team leader on the Bagley Creek project involves extensive quarterly monitoring of fish, wildlife, noxious weeds, canopy cover, flow and water chemistry (pH, nitrates, turbidity, temperature, dissolved oxygen, and conductivity) and yearly assessments of pools, large woody debris, and benthic macroinvertebrates (tiny organisms).

Sue works part time and was looking for a volunteer project that would allow her to do something for the environment.

"The concept of stewardship is very important to me," Sue said. "I want to help make the world a healthy and livable place for all creatures. I love nature and being outdoors learning about my backyard and helping to preserve the local ecosystems."

Getting up close and personal with the world along a stream gives Sue some insight into a much bigger picture.

"I am continually surprised by the amazing diversity of life, and the fact that you can look at the surface and see the destruction humans have caused and feel hopeless about it," Sue said. "But the deeper and more closely you look, the more you see there is to protect, and that it is definitely worth working hard to protect."

Citizen groups enhance our understanding of Puget Sound's health

Citizen monitoring programs can play an important role in developing scientific information for use in resource protection and restoration efforts. Program volunteers receive thorough training and learn to apply consistent standards and protocols—under the expert guidance of qualified scientists. Citizens can and do collect data of known quality that it is accepted and used by a variety of government agencies. Financial resources are often limited, and citizen monitoring can provide important data.

The following three organizations are just an example of the many citizen monitoring groups around Puget Sound. If you are interested in volunteer opportunities in your area, a good place to start is the Department of Ecology's Watch Over Washington website at http://www.ecy.wa.gov/apps/wow/index.asp. Follow the link to "Volunteer Opportunities."

Streamkeepers of Clallam County

Because streams can't take their own temperature

Contact: Ed Chadd or Jessica Tausend Baccus
(360) 417-2281 or
streamkeepers@co.clallam.wa.us

Streamkeepers of Clallam County has a motto: "We do stream monitoring, and we do it really, really well." With a cadre of more than 100 well-trained volunteers, Streamkeepers has reason to boast.

Volunteers receive training and refresher courses in protocols and procedures from Streamkeepers staff and professional scientists. They also learn about watershed systems, regulations and restoration.

After training, volunteers become part of a team, usually three to 10 people, who monitor one to two streams. They also receive feedback and assistance throughout the year. By the time Streamkeepers' volunteers finish their training, they know the work they'll be doing is based on high standards and sound science.

Volunteers monitor quarterly at multiple sites on 12 streams in Clallam County, ranging from Sequim on the Strait of Juan de Fuca all the way to Forks on the Pacific Coast. The monitoring provides baseline information about stream conditions, tracks changes over time and screens for potential problem areas. Sampling includes 25 measures of stream health in three categories: biological, chemical and physical. Once a year, volunteers do a ***Streamwalk***—a rapid, broad-scale assessment of an entire stream.

Streamkeepers started as a grant project through WSU Cooperative Extension of Clallam County in 1997. Two years later, with the project gaining momentum, the county voted to continue partial funding and move the program into county government.

To supplement its county funding and provide a valuable service to the community, the Streamkeepers organization has its volunteers do special monitoring projects at the request of various citizens to help advance watershed planning or stream restoration. For example, the group has been monitoring irrigation ditches as part of a multi-million dollar pollution-control project. Sponsors of restoration projects use Streamkeepers data to plan and track the effectiveness of their projects. Watershed planning groups use Streamkeepers' data to write watershed management plans.

Ed Chadd, co-manager of Streamkeepers, applauds the people in the program for making it a success.

Streamkeepers volunteers are retirees, working people and students who are interested in environmental careers. Volunteers have been as young as 8 and as old as 92. Many joined because they are interested in sportfishing and outdoor recreation. According to Chadd, they are all united by a strong sense of caring for the place where they live.

The group has ambitious plans for the future, and county staff, volunteers and technical advisors all participate in the decision-making process.

"We hope to remain on the cutting edge of citizen monitoring—to demonstrate what a highly motivated and well-organized group of volunteers can do," Chadd said. "We believe we can do quite a lot."

Forage Fish Surveys

Closing the knowledge gaps

Contact: Kevin Long
(360) 379-8051 or nosc@olympus.net
Websites: http://www.nosc.org and
http://mrc.co.jefferson.wa.us/

Forage fish (bait fish)—such as sand lance and surf smelt—are a critical food source for returning adult salmon on their way to spawning streams, resident salmon that may never leave Puget Sound, and juvenile salmon heading out to the open ocean. These forage fish spawn on sand and gravel beaches. Some species, such as surf smelt, are quite particular about what kind of beach they'll use for spawning and are vulnerable to development and construction activities.

The Washington Department of Fish and Wildlife began surveying forage fish spawn-

ing sites in the 1990s; however, lack of resources left large gaps in the understanding of where these fish spawn.

To close this knowledge gap, citizen groups in seven northern Puget Sound counties are carrying out two-year surveys to identify and document additional spawning areas and re-document previously identified areas from Fish and Wildlife studies. One group, the **North Olympic Salmon Coalition** (NOSC) in partnership with the **Jefferson County Marine Resources Committee,** is busy sampling beaches in Jefferson County. So far, NOSC staff biologists, assisted by volunteers, have taken 238 samples from about 42 miles of shoreline. Forty-two volunteers have donated 542 hours of labor in this effort.

"Volunteer involvement has been vital in the continued success of this project," says Neil Harrington, former volunteer coordinator with NOSC.

Volunteers were trained by Dan Penttila, a Fish and Wildlife forage fish expert, whose protocols are used by all the Marine Resource Committee groups conducting these surveys. NOSC volunteers learn how to sample forage fish spawning sites, and how to categorize nearshore habitats and use current global positioning satellite (GPS) equipment.

Funding for the project comes from a grant to the Jefferson County Marine Resources Committee from the Northwest Straits Commission and a grant to NOSC from the state Salmon Recovery Funding Board.

So far, surveys have found 12 samples positive for sand lance or surf smelt spawn from sites on Discovery Bay, Port Townsend Bay, Oak Bay, Kilisut Harbor, Port Ludlow Bay and Paradise Bay. Of these 12 samples, five were in previously undocumented spawning areas and represent nearly a mile of newly identified spawning habitat.

Information collected from these surveys will serve several purposes. Current results will be used to guide NOSC in next season's sampling activities.

"Perhaps most importantly, the end result will be an increased awareness of the needs of forage fish among shoreline land owners and improved stewardship of our coastline," Harrington said.

People for Puget Sound's Rapid Shoreline Inventory

Educating and involving citizens to be shoreline stewards

Contact: Tom Dean
(206) 382-7007 or tdean@pugetsound.org
Website: http://pugetsound.org

On the beaches of Puget Sound, volunteers with **People For Puget Sound's Rapid Shoreline Inventory** (RSI) Program are gathering physical and biological information about shoreline and nearshore habitats. They hit the beach at extreme low tides to collect data on eelgrass, invertebrates and bottom sediments that are rarely visible.

"Technically, RSI is an inventory program, not a monitoring program," said Tom Dean, restoration project manager with People for Puget Sound. "It's designed to gather a snapshot of information, rather than a continuing stream."

This snapshot, however, provides high-quality data useful for assessing the health of Puget Sound. The data has many potential uses such as identifying beaches that may be good candidates for shoreline preservation or restoration.

"The inventories of intertidal wildlife and vegetation could also be useful as a biological baseline in case of an oil spill or other disaster," Dean said.

RSI volunteers go through a rigorous 10-hour training program to be qualified to gather data. Volunteers learn about beach ecology and the proper way to collect data and then they practice in the field. A staff person or a highly trained volunteer checks the quality of the data on-site.

Many of the 100 or so RSI volunteers are retirees who are able to gather data on weekday low tides. Some are shoreline property owners who want to learn first-hand about beach habitats. High school-age volunteers also provide excellent data gathering.

RSI started as a pilot project in 2000 with funding from the Puget Sound Water Quality Action Team's Public Involvement and Education (PIE) fund program and the Whatcom Marine Resources Committee through ReSources. Last year's efforts were funded by the Skagit Marine Resources Committee, King County, King County Conservation District, and the National Fish and Wildlife Foundation. People For Puget Sound staff hope more local governments will see the value of the information and provide support.

In two years, The RSI program has already mapped 25 miles of shoreline in four counties—San Juan, Whatcom, Skagit and King. This is actually great progress even though Puget Sound has a total of 2,100 miles of marine shoreline. Each 150-foot section of shoreline mapped by volunteers contains 50 different physical and structural features.

People For Puget Sound does not plan to inventory every shoreline. They use the ShoreZone aerial mapping inventory provided by the Washington State Department of Natural Resources and other available data to target important beach segments for further, more in-depth study.

"We are just now developing our data analysis to the point where we can make well-reasoned recommendations for conservation and restoration actions based on RSI data," Dean said. "This is the exciting part, where the program begins to contribute to the improved health of Puget Sound."

Volunteer Focus

John Cornelison

People for Puget Sound's Rapid Shoreline Inventory

Photo by Phil Bloch, People for Puget Sound
John Cornelison, left, and Bruce Burgland share a laugh while monitoring a Vashon Island beach.

John Cornelison has been volunteering with People for Puget Sound's Rapid Shoreline Inventory project on Vashon Island for nearly a year.

"I understand that Vashon is host to a disproportionately large share of Puget Sound's game fish—those that the salmon depend on as their food source, such as herring," Cornelison said.

Cornelison, a software development consultant, is a newcomer to volunteer monitoring. He joined People for Puget Sound on a whim because it sounded like fun. Months later, he's still enthusiastic about what he's doing.

"I find it really stimulating because our Sound is such a world-class treasure," Cornelison said.

Not only does he feel as if he's making a valuable contribution, Cornelison said he's learned from experts how to identify many of the sea creatures he only heard of as a landlubber.

He is also impressed with the level of commitment from fellow volunteers.

"There's just something about volunteering that introduces you to quality people you've never otherwise come into contact with," he said. "I'd heartily suggest it for anyone who enjoys walking a beach!"

Puget Sound's Health

The Puget Sound Ambient Monitoring Program (PSAMP) is a coordinated effort among state, federal and local agencies to measure the health of Puget Sound's waters and resources. The program complements monitoring by local governments and citizen volunteers.

PSAMP studies reveal how the changing marine environment affects birds and mammals

When PSAMP scientists want to monitor diving marine birds and waterfowl throughout Washington's inner marine waters, they take to the air.

Aerial surveys are one of the primary tools used to collect the data that helps scientists understand spatial patterns in habitat use and changes in populations. Dave Nysewander, of the Washington Department of Fish and Wildlife, heads the Marine Bird and Mammal component of Puget Sound Ambient Monitoring Program.

Nysewander is supported in his efforts by Joe Evenson, Bryan Murphie, Thomas Cyra, Steve Jeffries, and Dyanna Lambourn of Fish and Wildlife; Mary Mahaffy of the U.S. Fish and Wildlife Service; and a number of collaborators.

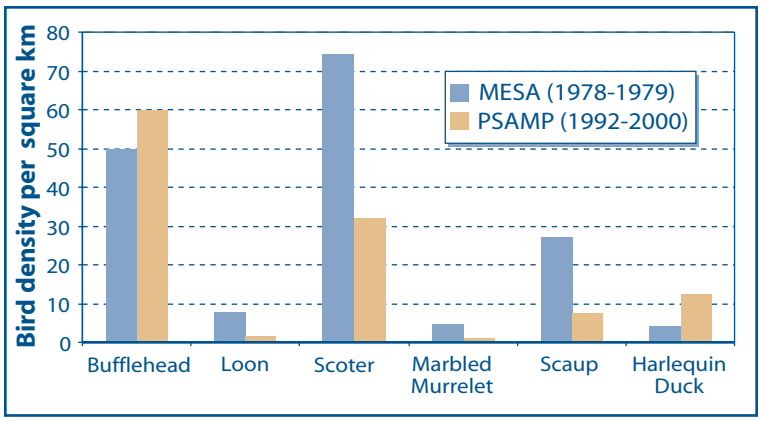
Since 1992, Nysewander and his colleagues have conducted winter aerial surveys of nearshore marine birds in Puget Sound. They estimated trends in the population densities of several bird species by comparing recent PSAMP observations during the 1992 through 2000 period with compatible data collected during 1978 and 1979 as part of the Marine Ecosystem Analysis (MESA) program administered by the National Oceanic and Atmospheric Administration and funded by U.S. Environmental Protection Agency.

Comparing results from these studies showed trends in bird densities during the 20-year interval for 18 species or species groups that winter in Puget Sound. The results indicate a mixture of changes that included many significant decreases such as: marbled murrelets (96 percent reduction); Western grebes (95 percent reduction); long-tailed duck (91 percent reduction); combined loon species (79 percent reduction); scaup (72 percent reduction); brant (66 percent reduction); scoters (57 percent reduction); pigeon guillemot (55 percent reduction); and combined cormorant species (53 percent reduction).

Dave Nysewander

In contrast, several species were more stable during this 20-year interval, including goldeneyes, buffleheads and gulls, while a few species increased in numbers. Harlequin ducks (189 percent) and mergansers (55 percent) showed the most notable increases.

It is uncertain whether these changes are due to climate cycles or more local changes in forage fish stocks that are food for these birds. Bird species that either eat fish or depend upon certain spawning events of Puget Sound forage fish appear to have declined more than species that feed mostly on other groups in the food web, such as crustaceans and invertebrates. Fewer scoters and scaup are in other marine areas throughout the Pacific Flyway, suggesting they have not moved from Washington to some other part of their wintering range.



Changes in densities for selected marine bird species between 1978-79 and 1992-2000.

The Marine Bird and Mammal component has also monitored harbor seals at haulout sites in greater Puget Sound in collaboration with an ongoing effort conducted by Steve Jeffries, with Washington Department of Fish and Wildlife, and the National Marine Fisheries Service. The agencies initiated this monitoring in 1978 after seals received protection under the Marine Mammal Protection Act in 1972.

This component also supports ongoing marine mammal monitoring, with an emphasis on trends in harbor seal numbers, their reproductive success, and concentrations of toxic contaminants in their tissues. These studies help determine how wildlife in the Puget Sound basin is responding to a changing marine environment.

Harbor seal abundance has increased three-fold since 1978. The 1999 estimate for Washington's inland harbor seal stock was 14,600. Analysis suggests that Washington's inland harbor seal population is near the current carrying capacity of the environment, or the number that can be sustained in the long-term. This does not mean that the seal population has reached its historical size since the region's capacity for supporting harbor seals may have changed.

The Marine Bird and Mammal component has participated in other studies during the last 10 years that addressed topics such as contaminant levels in scoters and harbor seals; monitoring of Great Blue Herons; more detailed studies on selected species such as pigeon guillemots and marbled murrelets; and monitoring and development of photographic atlases of resident gray whales.

● For more information about PSAMP and its activities, contact Pete Dowty, science coordinator with the Action Team, at (360) 407-7561 or pdowty@psat.wa.gov.

'Puget Sound's Health' goes to school

Students in Joyce Nishimura's 7th-grade science class are improving their reading skills and their knowledge of Puget Sound by using the ***Puget Sound's Health 2000*** in their classroom.

Last fall, the Action Team, with the help of Laurie Spikard, an educational consultant, put together a reading guide to accompany ***Puget Sound's Health 2000.*** Nishimura, a science teacher at Woodward Middle School in Bainbridge Island, is one of the first teachers in the Puget Sound area to put the reading guide to use.

Under Washington State's learning requirements in reading, students are expected to read and comprehend a variety of materials with different purposes. The ***Puget Sound's Health Reading Guide*** helps teachers teach students how to read and interpret technical and scientific documents using a systematic strategy. Not only do students thoroughly examine the text, they also learn how to understand the many charts and graphs that appear throughout the report.

Photo by Scott Orness, Woodward Middle School
Joyce Nishimura, a 7th-grade science teacher at Woodward Middle School in Bainbridge Island, pores over *Puget Sound's Heath 2000* with some of her students. In the photo are (clockwise from Ms. Nishimura): Ben Tully, Zack Conner, Marijke Schwarz-Smith and Fiore Aláilima.

Puget Sound's Health Reading Guide encourages teachers to tailor the activities to their own style and classroom's needs.

"It's a springboard to a number of meaningful activities on a very important topic," Nishimura said.

Nishimura had her students form teams and become experts on one of the indicators of the environmental health of the Sound. Teams did further research using several different technical documents to support what they learned about the status and trends of each indicator. Then they presented their findings to their fellow classmates using PowerPoint.

With the recent publication of the ***Puget Sound's Health 2002,*** teachers can expect an updated reading guide to be available by next fall. For more information on how you can get the reading guide and extra copies of ***Puget Sound's Health 2002*** for your classroom, contact Mary Knackstedt, the Action Team's public involvement and education coordinator, at (360) 407-7336 or mknackstedt@psat.wa.gov.

Get news from the Action Team sent directly to you

Join the **Puget Sound Water Quality Action Team's listserv** and get news releases sent directly to you. The Action Team's listserv is an efficient and cost-effective way to get news to reporters and you quickly.

All Action Team news releases that are sent to media sources throughout the Sound will be sent to subscribers on the listserv. To subscribe, visit our web page at www.wa.gov\puget_sound

Get Sound Waves electronically

You may also receive *Sound Waves* online by subscribing to the Action Team's ***Sound Waves* listserv** by going to http://listserv.wa.gov/archives/sound-waves.html

Coming in May...

Aliens invade Point Defiance Aquarium!

Alien! Invaders are coming to Tacoma's Point Defiance Aquarium in May. The new permanent interactive exhibit will feature non-native plants and animals that threaten fresh and marine aquatic ecosystems in Puget Sound and the Pacific Northwest.

If the right conditions are present, these invaders can take over habitats occupied by natives, prey on local species and reduce the biodiversity of an ecosystem.

Brett Dumbauld, Washington State Department of Fish and Wildlife
Green crabs *(Carcinus maenas)* and some of their fellow alien species will be on display at the Point Defiance Aquarium starting in May.

The ***Alien! Invaders*** exhibit will include live European green crabs and smooth cordgrass—species that have already invaded Puget Sound. Illustrations of other invaders on the march that haven't reached us—yet—will also be part of the exhibit. Visitors to the aquarium may also match some of the more troublesome non-native species with their rap sheets in a section of the exhibit called ***The Pacific Northwest's Most Unwanted***. Because aliens frequently invade by hitching a ride with unsuspecting people, the exhibit illustrates ways that people can prevent the introduction of these treacherous stowaways.

The exhibit was created through a partnership with the Point Defiance Zoo & Aquarium and the Tacoma branch of the University of Washington and funded by the Public Involvement and Education (PIE) fund, financed by proceeds from the Washington Water Quality Account and administered by the Puget Sound Water Quality Action Team. For more information, call John Rupp at the Point Defiance Zoo and Aquarium at (253) 404-3675 or check out the aquarium's website at http://www.pdza.org.

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What happened to the calendar?

An up-to-date calendar of water quality-related events is available on the Action Team's website. Go to http://www.wa.gov/puget_sound and follow the link on the top of the page to "calendar of events."

Sound Waves is produced quarterly by the Puget Sound Water Quality Action Team.

If you would like this document in an alternate format, call (360) 407-7300, (800) 54_SOUND, or the TDD number: (800) 833-6388.

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The Puget Sound Water Quality Action Team works with organizations to protect and restore Puget Sound. The Action Team includes representatives from some state agencies and some tribal, federal and local governments. A Council of business, environmental organization, and local and tribal government representatives and the legislature advises the Action Team.

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Puget Sound Council Members

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Business
Kirk Anderson,
Fisher Communications, Inc.

Environmental Community
Tom Putnam,
Puget Soundkeeper Alliance

Shellfish Industry
Bill Dewey, Taylor Shellfish Co. Inc.

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Counties
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Tribes
Fran Wilshusen, Northwest Indian Fisheries Commission

State Senate
Tracey Eide (D-Federal Way)
Pam Roach (R-Auburn)

State House of Representatives
Phil Rockefeller (D-Kitsap)
Mark Schoesler (R-Ritzville)

Action Team Members

Cities
Position to be filled

Counties
Position to be filled

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Busse Nutley, Director

Department of Ecology
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Department of Fish & Wildlife
Jeffrey Koenings, Director

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Department of the Environment

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